

55. (New) The fluid fitting assembly as defined by claim 53, wherein
each said engaging portion of the ferrule device includes at least one
longitudinally extending slot to facilitate engagement with the respective tube
member.

REMARKS

The Applicant respectfully requests reconsideration of the objections and
rejections set forth in the Office Action dated February 23, 2004.

The Rejection under 35 U.S.C §112:

Claims 1-36 stand rejected over 35 USC §112, second paragraph, as being
indefinite for the reasons set forth in the Office Action. The Applicants have
amended these claims in the manner suggested by the Examiner, and believe all
claims are now sufficiently definitive to meet the requirements of §112. Regarding
the definition of the term RAM, the Applicant submits that this term neither has any
specific meaning nor is an acronym.

The Rejection under 35 U.S.C §102(b):

The Examiner has rejected claims 1-3, 5, 11-17, 25, 28, 29 and 35 under 35
USC §102(b) as being anticipated by Johnston et. al., and has further rejected claims
4 and 23 are rejected under 35 USC §103(a) as being unpatentable over Johnston et
al. in view of Kreidel et al. In view of the above-indicated amendments and the
forgoing remarks, the Applicants respectfully disagree.

Briefly, as amended, exemplary claim 1 recites a high pressure fluid fitting assembly adapted for a fluid-tight coupling of a tube member to a connector member having a receiving port defined by an interior sealing wall and a bottom end wall. The receiving port of the connector member is formed for sliding receipt of the tube member until a distal end thereof seats against the bottom end wall. The connector member further defining a passage extending therethrough and terminating in the receiving port. The fluid fitting assembly includes a RAM device having proximal surface and an opposite distal surface facing toward the connector member. An interior alignment wall thereof defines an alignment passage extending from the proximal face to the distal face for sliding receipt of the tube member therethrough. The fluid fitting further includes a ferrule device having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage. The passage extends from the tube engaging portion to the sealing portion, and is formed for receipt of the tube member therethrough. The tube engaging portion is further formed and dimensioned to contact the RAM device alignment wall and the sealing portion is also formed and dimensioned to contact the connector member sealing wall.

Hence, when a compression force is increasingly applied to the RAM device in the direction toward the connector member, the RAM device alignment wall contacts the ferrule device tube engaging portion in manner causing an interior gripping surface thereof to increasingly radially grip the tube member for movement of the ferrule device and the RAM device, as a unit, toward the connector member. This cooperation increasingly urges the ferrule device sealing portion into fluid sealing engagement with the connector member sealing wall to fluidly couple the tube member conduit to the connector member passage, and increasingly urges the distal end of the tube member into seated engagement with the bottom end wall of the connector member.

Accordingly, a single or multi-lumen, high pressure, fluid connection system is provided which enables a technician to connect a single or multiple lumens (tubes), as a cluster, to a connection device by simply pushing the tubes into the fluid fitting assembly and turning a spanner nut to lock the tubes into place. Hence, a simple rotational force applied by the spanner nut (only about 100 lbf) is translated into a substantial axial sealing force at each tube member to provide fluid coupling of pressures up to about 2000 psi. As mentioned at page 16, lines 6-8 of the present pending application “[t]his arrangement can exert up to about 100 lbs of force per ferrule, resulting in a fluid tight seal suitable for applications up to about 2000 psi”.

Moreover, the fluid fitting assembly of the present invention is specifically configured for high pressure applications. As stated at page 9, lines 5-8:

The fluid fitting assembly 20 of the present invention is preferably applied in high pressure (i.e., up to about 2000 psi) flat-face or rotor valve technology, as exemplified in the rotor valve 43 of FIGURE 3 and as described in U.S. Patent Nos.: 4,158,630; 4,625,569 and 5,650,577.

Thus, in these high pressure applications, it is particularly important to eliminate any dead space between the bottom end wall 52 of the receiving port 26 and the distal end of the tube member 21, so as to minimize movement or vibration during the high pressure throughput. Accordingly, as claimed, the design of the present invention not only radially grips the tube member(s) (21), but also to axially urge the distal end(s) thereof “into seated engagement with the bottom end wall (52) of the connector member (22)” (numbering added). As exemplified in the present pending application at page 15, lines 29 -31:

As the ferrule device 35 clamps down upon the tube member 21, further axial movement of the RAM device 28 cause the ferrule device and the tube member collectively move as a unit.

As shown in FIGURE 2 of the present pending application, the RAM device 28 is moved in the direction of arrow 40, the engaging portion 36 of the ferrule devices 35

are caused to increasing grip the tube member in the direction of arrow 41. As the RAM device 28 is further moved in the direction of arrow 40, the distal end of the tube member 21 is caused to engage and seat against the bottom end wall 52 to remove any dead space.

Johnston, in contrast, discloses a connector for multiple lines that forms a seal about the tubing with the ferrules 64, 66 through significant deformation, similar to other ferrule designs. That is, since it is not particularly suitable for high pressure applications in the operation ranges of the present invention, the connector of Johnston does not attempt to seat the distal end of the tubing against any backing or interior end wall. In fact, the connector of Johnston attempts to keep the tubular members relatively stationary so that a seal can be formed during deformation. That is, while the first disk 30 and the second disk 40 of Johnston are caused to clamp together toward one another, in order to deform the tubing, the ferrules 64, 66 and the tubular members are not caused to move forwardly together as a unit.

In view of the foregoing arguments and amendments, withdrawal of the §102(b) and §103(a) rejections are respectfully requested.

Conclusion

In light of the above amendments and remarks, the Applicants respectfully request that the Examiner reconsider this application with a view towards allowance. It is believed that all claims now pending and all Previously Presented claims fully and patently define the subject invention over the cited art of record and are in condition for allowance.

If the Examiner has any questions concerning this case, the Examiner is respectfully requested to contact Michael L. Louie at (510) 843-6200.

The Commissioner is hereby authorized to charge any additional fees, including any extension fees, which may be required or credit any overpayment directly to the account of the undersigned, No. 50-0388 (Order No. RHE1P004).

Respectfully submitted,

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